SNOW DISPOSAL GUIDELINES FOR THE PROVINCE OF ALBERTA

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Any comments, questions, or suggestions regarding the content of this document may be directed to:

Environmental Sciences Division
Alberta Environment
4th Floor, Oxbridge Place
9820 – 106th Street
Edmonton, Alberta T5K 2J6
Phone: (780) 427-5883
Fax: (780) 422-4192

Additional copies of this document may be obtained by contacting:

Information Centre
Alberta Environment
Main Floor, Great West Life Building
9920 – 108th Street
Edmonton, Alberta T5K 2M4
Phone: (780) 944-0313
Fax: (780) 427-4407
Email: env.infocent@gov.ab.ca

A. INTRODUCTION AND BACKGROUND

Snow falling onto municipal roads and highways, may become mixed with contaminants such as suspended solids, organic chemicals, phosphates, dissolved salts, heavy metals, trash, and oil. These substances are not normally characteristic of freshly fallen snow, they are a result of urbanization, industrialization and of the related activities of people. The collection and removal of snow may pose a risk to the environment if it is disposed of improperly.

Alberta Environmental Protection strongly discourages the direct dumping of waste snow into watercourses, or onto ice-covered water bodies as this may introduce contaminants to the water bodies and produces unsightly conditions. The preferred locations are inland sites. Such sites should be selected and designed to maximize treatment, minimize safety hazards and control the rate and location of snow melt discharges.

These guidelines are intended to assist urban centres and municipalities to develop methods of waste snow disposal that minimize the potential for negative environmental impacts.

B. SITING GUIDELINES FOR SNOW DISPOSAL SITES

The location of snow disposal sites, especially permanent sites, must be well planned in order to minimize environmental impacts and other impacts such as noise. Disposal sites must be large enough to accept the projected amount of snow that may be deposited during any one year. They should be close enough to the serviced area to minimize hauling costs, yet not be a nuisance to surrounding land users.

The following points should be considered when selecting a snow disposal site:

1. LANDFILLS

It is not advisable to dispose of snow in or adjacent to landfills. The snowmelt may increase the generation rate of landfill leachate. Leachate is any liquid that has passed through or emerged from waste material and contains soluble, suspended, or miscible materials removed from such wastes. It poses a threat to groundwater and its collection, treatment and disposal can be involved and expensive.

2. AGRICULTURAL LAND

It is not advisable to place sites on prime agricultural land. The metals, hydrocarbon residues, salts, and sand usually found in waste snow can pollute and devalue such property, unless rigorous site selection and management criteria are practised.

3. GROUND WATER

The location, depth and nature of any groundwater aquifers in the area of a proposed snow disposal site should be carefully evaluated. It is not advisable to choose sites above a groundwater aquifer with a high water table or that is used as a potable water supply source. Pollutants, particularly chlorides, may percolate down into the groundwater and adversely affect the quality of water in the underlying aquifer. A hydrogeological study may be necessary to determine the appropriateness of the site for snow disposal.

4. UTILITIES

It is not advisable to locate snow disposal sites on lands with below ground or above ground utilities. Electrical transmission right-of-ways should be avoided unless strict restrictions are placed on the height of the waste snow piles. Snow disposal over underground utilities can create significant repair and/or maintenance problems. The generally high chloride content of waste snow may also accelerate the corrosion and deterioration of above or below ground concrete and steel structures.

5. NOISE

To mitigate the impact of noise, sites should be located a minimum of 350 metres from existing or planned residential housing. An objectionable noise level can be produced by snow hauling and dumping operations, particularly as they are commonly undertaken at night. A dumpsite and associated road access should, therefore, not be in a location where noise of the operation will be a nuisance to nearby residents. Sites in hollows or other locations where natural or artificial barriers will baffle sound are preferred. In some cases, the snow pile itself can be situated in such a way as to create a sound barrier.

6. DRAINAGE

Snow disposal sites should be located in areas with sufficient storage capacity or with adequate drainage to prevent flooding of adjacent lands. Snow deposited at the site should be placed in such a manner that existing drainage patterns are not obstructed. For disposal sites located within urban drainage areas, it is preferable to prevent meltwater from entering combined storm/sanitary sewer systems where surcharging may result in raw sewage bypasses and overflows.

7. SITE EXPOSURE

Snow disposal sites should be located to maximize exposure to the sun, particularly the afternoon sun. This will ensure a relatively rapid melt. Melting waste snow is somewhat unsightly in appearance and therefore the faster it melts the less of an eyesore it will be. A faster melt period will also permit the ground to dry much quicker.

8. RECREATION

Snow disposal sites should not be used as, or located in, recreational areas for small children, because of their propensity to play in the dirt and then put their fingers in their mouths. From an overall quality standpoint, snowmelt water may also not be suitable for use in a recreational water body.

9. WATERBODY SET BACK

A minimum setback distance of 200 metres from any water body is required, sites with gradients greater than 15 degrees will require greater setback distances.

C. DESIGN GUIDELINES FOR SNOW DISPOSAL SITES

A selected snow disposal site needs to be engineered to minimize environmental impacts. The specific environmental protection measures required will depend on the possible risk and impacts associated with each individual site.

The following are impact mitigation measures that may be required at a snow disposal site:

1. CONTAINMENT

Containment structures such as earthen berms and compacted subgrades may be necessary. These types of structures can be used to direct meltwater and surface runoff to settling ponds and to minimize the possible seepage of contaminants into groundwater. Berms also provide for noise attenuation from snow disposal activities and improve aesthetics particularly for adjacent land users. Berm erosion protection may be necessary. Landscaping vegetation around berms or adjacent to the snowmelt area should be salt tolerant as snowmelt water may be high in salts.

2. SETTLING PONDS

Constructed settling ponds may be necessary to reduce suspended particulate loadings in meltwater thereby minimizing impact to downstream receiving facilities (e.g. sewage treatment plants) or downstream surface waters. Ponds should be sized relative to anticipated snow meltwater volumes. Ponds and trench construction should provide retention times of at least four days (total) for suspended particulate settlement. Settling ponds may have to be lined depending on local soil and groundwater conditions.

3. GRADING

Snow disposal sites should be graded so as to minimize snowmelt runoff percolation to groundwater. The sites should be graded so that runoff from outlying areas does not enter the site.

4. RELEASE OF MELTWATER

Meltwater discharge structures may be required to allow for control of off-site discharge of meltwater to receiving facilities and downstream surface waters. Such control allows for meltwater release during periods of optimum dilution and/or control of releases during storm events. A suitable flow control system (e.g. weir or flume) should be installed at the outlet of all settling ponds.

5. SITE BASE

Soils under snow piles should be relatively impermeable and an appropriate thickness of compacted inorganic clay may be required. Where native clay is not available, site surfaces can be underlain with waterproof membrane materials, asphalt, imported clay or any other similar material.

6. SECURITY

Security fencing and lighting should be provided to limit unrestricted and unauthorized access. Security protects against dumping which is unrelated to snow disposal and reduces the risk of accidental injury to the general public, particularly children.

D. GENERAL

1. SNOW REMOVAL

Snow from heavily travelled roads should be removed as quickly as possible following a storm. The level of contaminants found in snow tends to increase with traffic flow, and with the length of time that the snow remains on the road. Quickly removing snow will minimize the time that the waste snow has to accumulate such contaminants.

2. PERMANENT SITES

It is preferable to have permanent sites zoned solely for snow disposal. Permanent sites can be engineered to minimize environmental impacts and may also be less costly in the long run than having a number of temporary sites not specifically designed for the purpose of snow disposal.

3. SOLID WASTE DISPOSAL

Waste snow tends to accumulate various solid materials. To avoid turning the snow disposal site into a landfill, these solid wastes should be disposed of, as soon as is practicable, to an approved landfill.